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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/690,928                      10/22/2003                      Dong-Ho Han                      P16829                      6901

28062                      7590                      02/03/2006

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NEW CANAAN, CT 06840

EXAMINER
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LE, THAO X

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

610

**Office Action Summary**

Application No.

10/690,928

Applicant(s)

HAN ET AL.

Examiner

Thao X. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1)  Responsive to communication(s) filed on 23 December 2005.
- 2a)  This action is **FINAL**.
- 2b)  This action is non-final.
- 3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4)  Claim(s) 2-7 and 29-35 is/are pending in the application.
  - 4a) Of the above claim(s) 33-35 is/are withdrawn from consideration.
- 5)  Claim(s) \_\_\_\_\_ is/are allowed.
- 6)  Claim(s) 2-7 and 29-32 is/are rejected.
- 7)  Claim(s) \_\_\_\_\_ is/are objected to.
- 8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9)  The specification is objected to by the Examiner.
- 10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.
  - Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  - Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All    b)  Some \*    c)  None of:
    - 1.  Certified copies of the priority documents have been received.
    - 2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    - 3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1)  Notice of References Cited (PTO-892)
- 2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  - Paper No(s)/Mail Date \_\_\_\_\_.
- 4)  Interview Summary (PTO-413)
  - Paper No(s)/Mail Date. \_\_\_\_\_.
- 5)  Notice of Informal Patent Application (PTO-152)
- 6)  Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. Newly submitted claims 33-35 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: there is no generic claim. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 33-35 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6910266 to Lee et al.

Regarding claim 31, Lee discloses an apparatus in fig. 1C comprising: a substrate 42, col. 2 line 31; a pair of signal traces 43a/44a, col. 2 line 45, formed on the

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substrate 42 and spaced from each other, fig. 1c; a filler material 45a, col. 2 line 44, on the substrate 42 and between the signal traces 43a/44a, the filler material (comprises polymer ceramic power of high dielectric constant of about 80, col. 2 lines 37-38 and col. 10 line 24) having a dielectric constant that is higher than a dielectric constant of a material of which the substrate (FR-4 has dielectric constant about 4-5) is formed; and a metal ground plane 41, col. 2 line 52, on an opposite side of the substrate from the signal traces 43a/44a.

Regarding claim 32, Lee discloses the apparatus wherein: the signal traces 43a/44a are formed directly on the substrate 42, fig. 1C; the filler material 45a is directly in contact with the substrate 42; and the ground plane 41 is directly in contact with the substrate 42, fig. 1C.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2-5, 7, 30 are rejected under 35 U.S.C. 103(a) as being obvious over US 6910266 to Lee et al. in view of US 6236572 to Teshome et al.

Regarding claim 2, Lee discloses an apparatus in fig. 1c-d comprising: a substrate 42, a pair of signal traces 43a/44a, formed directly on the substrate 42 and spaced from each other; a filler material 45a directly on the substrate 42 and between the signal traces 43a/44a, the filler material 45a having a dielectric constant that is higher than a dielectric constant of a material of which the substrate 42, and a dielectric layer 47a, col. 2 line 54, directly on the signal traces 43a/44a and directly on the filler material 45a, fig. 1d, the dielectric layer of the filler material 45a being higher than a dielectric constant of the dielectric layer 47a.

But, Lee does not disclose an apparatus comprises a solder mask layer.

However, Teshome discloses an apparatus in fig. 6A comprises a solder mask layer 154 on the signal traces 160 directly on the FR4 substrate 156, column 6 line 3, and on the filler material 134, column 5 line 16. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to replace dielectric layer 47b of Lee with the solder mask layer teaching of Teshome, because it would have provided the protection to the conductive layer and control the flow of the solder as taught by Teshome, column 5 lines 40-43.

With respect to 'the dielectric constant of the filler material being higher than a dielectric constant of the solder mask layer', it would be obvious that the filler material 45a of Lee because the dielectric constant of solder mask would be reasonably assumed around 4.5 or similar to that of PCB.

Regarding claim 3, Lee discloses the apparatus wherein the substrate 42 includes a resin in which fiber are embedded, the dielectric constant of the filler 45a material being higher than a dielectric constant of the resin.

With respect to 'embedded fiber', Lee discloses substrate 42 is FR-4 PCB, col. 2 line 32, that typically would have embedded fiber, see Williams (US 2002/0048137) in [0006].

Regarding claims 4-5, Lee discloses the apparatus wherein the signal traces 43a/44a are formed of copper, col. 2 line 45, wherein the filler material 45a substantially fills a space between the signal traces.

Regarding claim 7, Lee discloses the apparatus wherein the filler material 45a has a dielectric constant in excess of 4, col. 10 line 25.

Regarding claim 30, Lee discloses the apparatus wherein a metal ground plane 41 on an opposite side of the substrate 42 from the signal traces, fig. 1C.

7. Claims 6 and 29 are rejected under 35 U.S.C. 103(a) as being obvious over US 6910266 to Lee and US 6236572 to Teshome et al. as applied to claims 2-5 above and further in view of US 6068782 to Brant et al.

Regarding claim 6 and 29, Lee discloses the apparatus wherein the filler material 45a substantially fills a space between the signal traces 43a/44a,

But Lee does not disclose the filler material 45a has a height that is substantially equal to a height of the signal traces and filler material includes polyvinylidene difluoride (PVDF).

However, Brandt discloses an apparatus wherein the filler material 120 has a height that is substantially equal to the height of the signal line 190, fig. 6. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the teaching of Brandt with Williams's device to create different configuration of embedded capacitor for indented used, MPEP 2144.07. Furthermore, the Applicant has no support data, which convinces that the particular claimed configuration is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing mating surfaces. In re Dailey 149 USPQ 47, 50 (CCPA 1966). See also Glue Co. v. Upton 97 US 3,24 (USSC 1878).

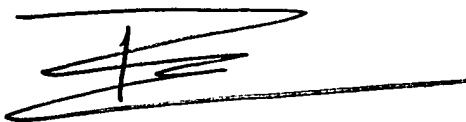
With respect to 'filler material includes polyvinylidene difluoride (PVDF)', Brandt discloses the capacitor dielectric can be a polymer and ceramic composite wherein the polymer comprises epoxy, polyimide, PVDF, col. 4 lines 18-23. At the time of the invention was made; it would have been obvious to one of ordinary skill in the art to use the PVDF teaching of Brand to replace the polymer ceramic of Lee, because such material substitution would have been considered a mere substitution of art-recognized equivalent values, MPEP 2144.06

**Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thao X. Le  
17 Jan. 2006